BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2008-0273
	)	
Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs	)	
	)	

JOINT REPLY BRIEF AND PROPOSAL FOR FEED-IN TARIFF OF ZERO EMISSIONS LEASING LLC AND CLEAN ENERGY MAUI LLC

AND

CERTIFICATE OF SERVICE

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ZERO EMISSIONS LEASING LLC ("Zero Emissions") and CLEAN ENERGY MAUI LLC ("Clean Energy Maui") respectfully submit this Joint Reply Brief and Proposal for Feed-in Tariff (attached as Appendix 1) in the above-referenced docket.

JOINT REPLY BRIEF

I. Given the four existing renewable producer options (Schedule Q, net metering, competitive bid, and non-bid PPAs), what contribution would FiTs make toward achieving Hawaii's renewable energy goals?

Based on Zero Emissions' "clean energy scenario planning" cost-benefit analysis, re-produced at Appendix 2 to this Reply Brief, a true FIT, such as Intervenors' FIT Option shown at Appendix 1 of this Reply Brief, would achieve Hawaii's 40% renewable electricity goal in about 12 years. Without a true FIT, the four existing renewable producer options (collectively, the "No FIT Option") would achieve Hawaii's 40%

renewable electricity goal in about 122 years. Zero Emissions' analysis is summarized in Table I:

	No FIT Option	HECO/CA FIT Option	Intervenors' FIT Option
Projected annual additions of renewable generation capacity	12 MW/yr	16 MW/yr	122.5 MW/yr
Projected annual additions of renewable electricity	35,171,273 kWh/yr	43,364,189 kWh/yr	359,089,439 kWh/yr
Number of years to achievement of 40% renewable electricity (~ 4,286 million kWh/yr)	122 years	99 years	12 years
Projected net benefit (cost) to ratepayers in $/kWh w/o energy security benefit	($0.000)	($0.006)	($0.008)
Projected net benefit (cost) to public in $/kWh w/ energy security benefit	$0.004	($0.000)	$0.026
Projected net benefit (cost) to public w/ energy security benefit	$211,561,852	($16,934,979)	$1,260,630,283

TABLE I: Projected Rates of Annual Additions to Renewable Generation and Projected Net Benefits and Costs of FIT Options

Commission Decisions

1. Should the Commission state a quantitative goal for renewables purchases in Hawaii generally and for FiTs specifically?

No. The Commission should not state a quantitative goal for renewable purchases in Hawaii generally because the legislature has stated such a goal in the Renewable Portfolio Standards (RPS) statute. Any quantitative goal stated by the Commission for FiTs specifically should be set to achieve no less than the quantitative goals of the RPS statute.

2. Are there gaps or suboptimalities in present programs that make FiTs necessary to achieve Hawaii's goals?

Yes. A true FIT, like Intervenors' FIT, is necessary to achieve Hawaii's goals because present policies do not address the key barrier to achievement of those goals: the utility's 100% monopsony power in the market for electricity generated for utility distribution.

Present and proposed policies relating to renewable generation are summarized in Table II:

	Small-scale Generation	**Large-scale Generation**
Ratepayer-funded	Net Energy Metering (< 100 kW) Schedule Q avoided cost rates (< 100 kW) De-linked negotiated power purchase agreement rates (< 2.7 MW on Maui and Hawaii) HECO/CA Feed-in Tariff (proposed) (< 100 kW; < 500 kW for PV) PV Host Pilot Program (proposed) (> 500 kW and < 1000 kW for PV) Intervenors' Feed-in Tariff (proposed)	Renewable Portfolio Standard quotas, penalties and RECs Competitive Bidding rates Intervenors' Feed-in Tariff (proposed)
Taxpayer-funded	Renewable energy technology income tax credit (< 175 kW for PV)	[None]

TABLE II: Hawaii Renewable Generation Policies

With the exception of renewable electricity that the utility is obliged to purchase at avoided cost rates from systems < 100 kW under Schedule Q, the utility has no obligation, under present policies, to purchase renewable electricity, generated for utility distribution, at a rate that gives the renewable generator an attractive return on its investment. Without a must-purchase obligation, the utility can and does use its

discretion – its 100% monopsony power in the market for electricity generated for utility distribution -- to refuse to purchase renewable electricity generated for that market, except on prices and terms that discourage the rapid development of renewable generation for that market.

Zero Emissions' "clean energy scenario planning" projects that present policies – wholly accommodative (except for Schedule Q) of the utility's 100% monopsony power in the market for electricity generated for utility distribution – will lead to annual additions of about 35 million kWh/year of renewable electricity, putting Hawaii on a 122-year schedule to achieve 40% renewable electricity. Zero Emissions' projects that the HECO/CA FIT[1] Option – which would perpetuate the utility's 100% monopsony power by giving the utility the discretion to specify annual quantity limits on its renewable electricity purchases under the HECO/CA FIT – would lead to annual additions of about 43 million kWh/year of renewable electricity, putting Hawaii on a 99-year schedule to achieving 40% renewable electricity. A true FIT that contains a must-purchase obligation eliminating the 100% utility's monopsony power in the market for electricity generated for utility distribution -- like Intervenors' FIT that is projected to lead to annual additions of about 360 million kWh/year of renewable electricity – is necessary to achieve Hawaii's energy goal of 40% renewable electricity in less than 20 years.

3. Net Metering: Should net metering be continued, without change, in the presence of a FiT? If not, what renewables (technologies and sizes) should Net Energy Metering apply to and what renewables should FiT apply to?

[1] Joint Proposal on Feed-in Tariffs of the HECO Companies and Consumer Advocate (the "HECO/CA Proposal") and KEMA, Inc., *HECO Feed-In Tariff Program Plan* (the "HECO Plan"), filed December 23, 2008 (the HECO/CA Proposal and the HECO Plan collectively referred to as the "HECO/CA FIT").

No. Net metering should be expanded, by elimination of system size and aggregate capacity limits, in the presence of a true FIT, like Intervenors' FIT, because a true FIT encourages development of renewable generation for utility distribution, whereas NEM encourages renewable self-generation. NEM and FIT should apply to all commercially proven renewable technologies (e.g., biomass and biogas, geothermal energy, landfill gas or sewage treatment plant gas, hydropower, photovoltaic solar, concentrating solar, onshore wind, offshore wind) without system size limits.

4. **Schedule Q: Should Schedule Q be continued, without change, in the presence of a FiT? If not, what renewables (technologies and sizes) should Schedule Q apply to and what renewables should FiT apply to?**

Yes. Schedule Q should be continued without change in the presence of a true FIT, like Intervenors' FIT. A true FIT, however, would make Schedule Q obsolete as an incentive for development of renewable generation for utility distribution.

5. **Negotiated power purchase agreements: Should present practices be continued, without change, in the presence of a FiT? If not, what renewables (technologies and sizes) should present practices apply to and what renewables should FiT apply to?**

Yes. Negotiated power purchase agreements (with rates de-linked from the price of fossil fuel) should be continued without change in the presence of a true FIT, like Intervenors' FIT. A true FIT, however, would make such agreements obsolete as an incentive for development of renewable generation for utility distribution.

6. **Competitive Bidding: Should present practices be continued, without change, in the presence of a FiT? If not, what renewables (technologies and sizes) should present practices apply to and what renewables should FiT apply to?**

Yes. Competitive Bidding should be continued without change in the presence of a true FIT, like Intervenors' FIT. A true FIT, however, would make Competitive Bidding obsolete as an incentive for development of renewable generation for utility distribution.

II. What are the physical limitations on the utility's ability to purchase renewables?

There are no *physical* limitations on the utility's ability to *purchase* renewables. As was established at the panel hearing, the only *physical* limitation on the utility's ability to *interconnect* renewables is the time availability of qualified engineers to perform the interconnection requirements studies (IRSs).

The only *economic* limitations on the *amount* of renewables that the utility should be obliged to *purchase* under a FIT are the principles that: (1) it does not make sense to oblige the utility and ratepayers to purchase renewable generation from intermittent sources (solar and wind) if such renewable generation displaces no fixed generation from imported fuels because of the need to maintain such fixed generation to maintain present-day levels of grid reliability, and (2) it does not make sense to oblige the utility and ratepayers to purchase renewable generation beyond the point that renewable generation meets 100% of the load for each island. These *economic* limitations -- which the HECO Companies and the Consumer Advocate persistently and misleadingly conflate with "technical" or "reliability" limitations on the utility's ability to "integrate" (that is, to *interconnect*) renewables[2] – justify the 25% island-wide grid penetration limits for wind generation[3] and the 20% island-wide grid penetration limits for solar generation,[4] and the

[2] *See* Opening Brief of the HECO Companies and the Consumer Advocate, filed June 12, 2009 in this docket (the "HECO/CA Opening Brief") at pp. 18-30 and pp. 78-92.
[3] *See* B. Parsons, M. Milligan, J.C. Smith, E. DeMeo, B. Oakleaf, K. Wolf, M. Schuerger, R. Zavadil, M. Ahlstrom and D. Yen Nakafuji, "Grid Impacts of Wind Power Variability: Recent Assessments from a Variety of Utilities in the United States," National Renewable Energy Laboratory Conference Paper

island-wide aggregate load limits for aggregate renewable generation, in Intervenors' FIT.

At page 30 of the Opening Brief of the HECO Companies and the Consumer Advocate (the "HECO/CA Opening Brief"), the utility and the Consumer Advocate contend that "it is necessary as part of an initial FIT design to incorporate reasonable limits on project size and system penetration" because "to integrate larger sized projects on the HECO and other island systems .. requires appropriate analysis and resource and system modifications to address technical issues and ensure that reliability is not adversely impacted." This repeats the falsehood found in the HECO/CA FIT itself, that "the design of the FIT ... must take into account ... the technical challenges with integrating large amounts of distributed FIT renewable resources on island power systems" and "unique technical challenges of incorporating large amounts of distributed renewable on island power systems ... establishes the need for Feed-In Tariff system caps and annual limits."[5]

While interconnection of any renewable generation of any size *may* pose "technical issues," such interconnection has *nothing* to do with the FIT, which is a *rate* specification, not a *technical* specification. The FIT rate paid for renewable electricity has nothing to do with the "technical issues" of interconnecting the renewable generation that produces the electricity, because meeting the utility's technical requirements *before*

NREL/CP-500-39955 (July 2006) http://www.uwig.org/Ewec06gridpaper.pdf ; J.C. Smith, B. Parsons, T. Acker, M. Milligan, R. Zavadi, M. Schuerger and E. DeMeo, "Best Practices in Grid Integration of Variable Wind Power: Summary of Recent US Case Study Results and Mitigation Measures," presented at Europe Wind Energy Conference '07, Milan Italy (May 2007) http://www.wapa.gov/UGP/PowerMarketing/WindHydro/EWEC07paper.pdf.

[4] *See* P. Denholm and R.Margolis, "Very Large-Scale Deployment of Grid-Connected Solar Photovoltaics in the United States: Challenges and Opportunities," National Renewal Energy Laboratory Conference Paper NREL/CP-620-39683 (April 2006) http://www.nrel.gov/pv/pdfs/39683.pdf; Paul Denholm and Robert M. Margolis, "Evaluating the limits of solar photovoltaics (PV) in traditional electric power systems," 35 Energy Policy 4424-4433 (Elsevier, September 2007).

interconnection has nothing to do with the FIT rate paid for renewable electricity *after* interconnection. No renewable generation *of any size* gets interconnected unless the renewable generation first meets the utility's own technical requirements (*e.g.*, Rule 14H) that exist separate and apart from the FIT rates.

The truth is that size and penetration limits on renewable generation eligible for FIT rates are completely unnecessary for addressing the "technical issues" of interconnection that are addressed specifically and appropriately by the utility's own technical requirements for interconnection. Size and penetration limits, like those in the HECO/CA FIT, on eligibility for FIT rates slows the speed, shrinks the size, increases the cost to ratepayers and deprives the public of the benefits of renewable generation development, but adds nothing to the utility's right to insist that renewable generation meet the utility's own technical requirements for interconnection before interconnection occurs.

Nowhere does the HECO/CA Opening Brief prove that "technical issues" and a need to "ensure that reliability is not adversely impacted" make "necessary ... limits on project size and system penetration."[6] The HECO/CA Opening Brief provides no

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[5] HECO Plan at 32-33 and 36.

[6] *See* HECO/CA Opening Brief at 30. The HECO/CA Opening Brief, at 18-30, devotes 12 pages describing the technical issues of interconnection, but contains *not one sentence* showing what these technical issues have to do with FIT *rates*. Evidence showing that technical issues establish the need for size limits on the amount of renewable generation eligible for FIT rates would include: evidence in any jurisdiction that has adopted FIT rates without size and penetration limits that lack of such limits has created technical issues for interconnection of renewable generation economically motivated by FIT rates, or that technical issues of interconnection have necessitated size or penetration limits on the development of renewable generation economically motivated by FIT rates; evidence that FIT rates themselves create technical interconnection or reliability issues that would not exist without the FIT rates; evidence in any jurisdiction that has adopted FIT rates that lack of size or penetration limits on availability of FIT rates has created "technical issues" that were not addressed by those jurisdictions' own technical requirements for interconnection. The HECO/CA Opening Brief presents no such evidence because it is not true that technical issues of interconnection require size or penetration limits on renewable generation eligible for FIT rates. Nowhere does the HECO/CA Opening Brief establish with evidence that "technical issues" of interconnection require size or penetration limits on the amount of renewable generation eligible for FIT rates.

evidence to support these statements, and cannot prove these statements, because these statements are not true.

The truth is that design of a FIT does not need to take into account the *technical* issues of interconnecting large amounts of renewable generation, but does need to take into account the *economic* challenges of interconnecting large amounts of *intermittent* renewable generation. It does not make *economic* sense to interconnect large amounts of wind and solar generation to the grid if the electricity produced by such intermittent generation is redundant to the firm electricity that the utility needs to maintain reliability.

The HECO/CA Opening Brief avoids this truth – of *economic* limits on the amount of intermittent wind and solar renewable generation that may be interconnected with the grid – by conflating it with the falsehood that "technical issues" and the need to "ensure that reliability is not adversely impacted" necessitate size and penetration limits on the amount of renewable generation that may be interconnected with the grid. The HECO/CA Opening Brief conflates truth with falsehood to falsely imply that grid penetration limits on intermittent renewable generation are justified by "technical" and "reliability" issues, rather than economic concerns.

The HECO/CA FIT further avoids this truth – that any limits on grid penetration of intermittent renewable generation are economic, not technical – by putting off the determination of these grid penetration limits to an indefinite time in the future under a utility-controlled Clean Energy Scenario Planning (CESP) process[7] that, like the now-terminated Integrated Resource Planning (IRP) process, is likely to facilitate opaque decision-making by the utility.

[7] *See* HECO Plan at 29-30:

The HECO Companies further avoided acknowledgment of this truth in their responses to the Commission's Information Request PUC-IR-1, in which the HECO Companies essentially refused to apply their knowledge and expertise to estimate such economic limits on grid penetration. The HECO Companies would have the Commission believe that economic limits on wind and solar grid penetration cannot be estimated, even though published literature of others' estimates is easily found.[8] The HECO Companies' response to the Commission's PUC-IR-1 suggests that the HECO Companies did not even bother to search for responsive information.

Commission Decisions

1. **Concerning standards and procedures to ensure that FiT sales promote reliability: Should they be part of the tariffs, or should they exist outside the tariff (e.g., in interconnection rules or in project-by-project negotiations)?**

Standards and procedures to promote *reliability*, such as General Order 7 and Rule 14H, already exist outside of and separate from tariffs, such as those prescribed by Decision & Order No. 24086 in Docket No. 7310 (Schedule Q), that specify *prices* that the utility pays to purchase electricity. Such standards and procedures are adequate to promote reliability regardless of the price paid by the utility, whether or not that price is an FIT rate, to purchase electricity from any source.

III. What are the appropriate criteria for eligibility to sell under FiT tariffs?

The appropriate criteria for eligibility to sell under FIT tariffs are: (1) the project uses an eligible technology, *e.g.*, commercially proven renewable technologies, including energy storage technologies; (2) interconnection of the project meets the utility's existing

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... The high level cumulative target settings by island will be incorporated and regularly updated in the CESP process. The annual FIT quantity targets will take this into account when the data becomes available. ...

technical standards and procedures for interconnection, *e.g.*, Rule 14H; and (3) interconnection of the project does not cause aggregate generation capacity including the project to surpass the island-wide grid penetration limits for intermittent renewable generation, or the island-wide generation capacity limit based on island-wide aggregate load.

Commission Decisions

1. Which technologies should be eligible for the FiT?

The following technologies should be eligible for the FiT because they are commercially proven:

Biomass and biogas
Geothermal energy
Landfill gas or sewage treatment plant gas
Hydropower
Photovoltaic
Concentrating solar
Onshore wind
Offshore wind

To the extent that energy generated by any of these technologies is stored and then delivered to the utility from an energy storage system (e.g., a battery), such energy storage systems should be treated as technologies eligible for the FIT, as provided in Zero Emissions' and Clean Energy Maui's Proposal for Feed-in Tariff attached at Appendix 1.

In addition, Zero Emissions and Clean Energy Maui support establishment of a "generic" FIT under which the utility would be obliged to take delivery of, purchase and pay for renewable energy, generated with technologies other than the technologies described above, at an FIT rate set low enough to ensure that purchases of such renewable energy would not result in any additional costs to ratepayers.

[8] *See* notes 3 and 4 and accompanying text relating to economic grid penetration limits for wind and solar.

2. What is the maximum and minimum capacity of projects that should be eligible for the FiT?

There is no maximum capacity of projects that should be eligible for the FiT, other than island-wide aggregate capacity limits based on island-wide aggregate grid penetration by intermittent renewable generation and island-wide aggregate load. The Commission might set a minimum project size of 1 kW or some other project size below which the administrative costs of establishing and maintaining the FIT Agreement outweigh its benefits.

3. Should projects owned by utilities or their affiliates be eligible for the FiT and, if so, under what conditions?

A utility affiliate-owned project should be eligible for the FiT, provided that (1) the utility, as a transmission & distribution entity, is obliged to take, purchase and pay for renewable energy delivered by the utility affiliate on the same terms as renewable energy delivered by an independent renewable energy generator, and (2) the Commission establishes a queuing procedure for interconnection priority that is uniformly applicable to projects owned by the utility affiliate and projects owned by independent renewable energy generators, and that does not allow the utility to discriminate against projects owned by independent renewable generators.

IV. What decisions are necessary to ensure that FiT rates are just and reasonable, as required by Hawaii law?

To ensure that FIT rates are just and reasonable, as required by Hawaii law, the Commission needs to make decisions supported by a cost-benefit analysis, like Zero Emissions' "clean energy scenario planning" cost-benefit analysis at Appendix 2, showing that the cost of such FIT rates to ratepayers are just and reasonable in relation to the benefits to the public (such as avoided fuel cost benefits, distributed generation

benefits and energy security benefits) of the additions to renewable generation engendered by such FIT rates.

Commission Decisions

1. Should the FiT facilitate the cost recovery of only the most cost-effective projects, a typical project, or most projects?

The FIT should facilitate cost recovery based on typical project costs, plus a return sufficient to induce rapid development of renewable generation.

2. What is a reasonable return on equity for a FiT project?

A return on equity for a FiT project is reasonable if it induces rapid development of renewable generation at minimal cost to the ratepaying public and maximal benefit to the public at large. Zero Emissions believes that the rates in Intervenors' FiT would provide a return on equity sufficient to induce annual additions about 122.5 MW/year and about 360 million kWh/year of renewable generation at an additional cost to ratepayers of about $.008/kWh, as shown in Zero Emissions' cost-benefit analysis at Appendix 2.

3. What cost and performance information is needed to calculate FiT rates?

Cost and performance information is not needed to calculate FIT rates. Cost and performance information is useful, however, to judge whether a given FIT rate is likely to encourage rapid development of renewable generation at minimum cost to ratepayers and maximum benefit to the public.

4. What are appropriate methodologies for calculating FiT rates?

An appropriate methodology for calculating FIT rates would: (1) look at PPA rates paid for renewable electricity in Hawaii, and FIT rates paid for renewable electricity in other jurisdictions, to see what additions to renewable generation were called forth by

such rates, (2) adjust the FIT rates paid for renewable electricity in other jurisdictions reflect known cost and performance differences for Hawaii; (3) establish initial FIT rates for Hawaii; and (4) review and adjust the FIT rates in Hawaii at intervals of 2 to 3 years based on an analysis of how much renewable generation has been called forth by the existing FIT rates.

5. What interconnection costs should the FiT developer bear?

Interconnection costs generally should be borne by the utility for small and medium-size projects, and should be borne by the renewable project developer for large projects, as shown in the "Interconnection Costs" table in Zero Emissions' Proposal for Feed-in Tariff at Appendix 1.

6. How should FiT participants be compensated for curtailment?

Under Intervenors' FIT, projects should be compensated at FiT rates for all renewable energy that would have been generated and delivered to the utility but for curtailment.

7. How should the FiT rates consider tax policies for renewables?

The FiT rates should not be discounted to reflect Hawaii state tax credits. A project should not be eligible to receive the FiT rate if the project owner receives the Hawaii renewable energy technology income tax credit.

8. Should the FiT rate to which a project is otherwise entitled, be adjusted downward to reflect any rebates or other financial benefits received by the project?

No. The project owner should receive the value of RECs or other green attributes from FiT projects because the project owner who took the risk in developing the renewable energy project is entitled to the rewards of the project, including the value of

any environmental credits associated with the project in any market set up for the exchange of such credits. FiT rates might be reduced to reflect the value of RECs to a FiT project owner, but the value of RECs in Hawaii is *de minimus* because such RECs are not currently exchanged in Hawaii and because the Commission's order in the Renewable Portfolio Standard docket established a $20/MWh penalty that establishes an upper bound on the value of RECs to Hawaii's utilities.

9. Should the FiT automatically reflect changes in tax law and renewables programs or should such changes take place in periodic updates?

FiT rates for new projects should not be automatically adjusted for changes in federal or state tax credits or renewable programs (such as RECs) because the actual financial effects of such changes might depend on subjective interpretations of the law. Creating a set of automatic adjustments for such changes would likely be a complex task because the actual financial effects of such changes would be difficult to predict at any time before the changes come into effect. Such changes should be reflected in periodic updates of the FIT.

10. How should the FiT account for project reliability benefits or lack thereof?

The FiT rates should not account for reliability benefits or lack of such benefits from certain projects and/or technologies because reliability benefits are a return to the utility and ratepayers, not to the project developer. If, however, the Commission wants to encourage especially rapid development of firm or dispatchable renewable generation projects that provides reliability benefits, the Commission might set FiT rates which incorporate a premium for technologies and project sizes that provide such reliability benefits. The Commission should set an initial FiT rate for energy storage technologies,

as shown in Zero Emissions' Proposal for Feed-in Tariff at Appendix 1, to induce the development of energy storage projects that provide such reliability benefits.

11. Once a project receives a FiT rate, under what circumstances should its FiT rate change?

Once a project receives a FiT rate, the FIT rate should not be permitted to change, with the possible exception of *force majeure* circumstances that include currency hyperinflation.

12. Should the FiT contain baseline rates for new technologies?

Yes.

13. How should FiT rates account for inflation?

FiT rates should not account for inflation. FiT rates should be levelized over the 20 year FiT term. It is up to the project investor to decide whether the levelized FiT rate provides an adequate return based on the investor's inflation expectations.

14. How could FiT rates comply with the "avoided cost" provision on HRS § 269-27.2?

Act 50, Session Laws of Hawaii 2009 (H.B. 1270), removed the "avoided cost" ceiling on utility purchases of renewable energy at FIT rates.

V. What non-rate terms are necessary to make FiTs just and reasonable?

Zero Emissions believes that island-wide grid penetration limits for intermittent renewable generation, and island-wide aggregate capacity limits for total renewable generation based on island-wide aggregate load, are necessary to make FITs just and reasonable because (1) it is not reasonable to oblige the utility and ratepayers to purchase renewable generation from intermittent sources (solar and wind) if such renewable generation displaces no fixed generation from imported fuels because of the need to

maintain such fixed generation to maintain present-day levels of grid reliability, and (2) it is not reasonable to oblige the utility and ratepayers to purchase renewable generation beyond the point that renewable generation meets 100% of the load for each island.

Commission Decisions

1. What should be the term of the FiT?

The term of the utility's obligation to buy renewable energy under the FiT should be 20 years commencing with initial delivery of renewable energy to the utility.

2. Is there a need for a service contract along with the feed-in tariff, or should the tariff itself contain all the necessary legal rights and obligations?

The FiT should be a tariff specifying, among other things, the utility's obligation to enter into a contract providing, among other things, for the utility's purchase of renewable energy at FiT rates and having the form attached as an exhibit to the FiT tariff. These written contracts generally should take the form of the Schedule FiT Agreement attached as Appendix I to the HECO Companies' Straw Feed-in Tariff and modified to conform to Intervenors' FiT. These contracts generally should cover the seller obligations contained in the HECO Companies' Schedule FiT Agreement as modified to conform to Intervenors' FiT.

3. What should be the rights and obligations associated with project output on expiration of the FiT term?

On expiration of the FIT term, the project owner should have the right to sell the project output according to whatever terms of sale might be negotiated between the utility and the project owner at the time of such expiration, regardless of whether FiT rates include or exclude an imputed residual value, because the projects are the property of the

owner and developed at the risk of the owner, who is entitled to whatever value (including compensation for energy sales) that might be obtained from ownership of the projects after expiration of the FiT term. Any compensation for any such energy sales under a negotiated power purchase agreement made 20 years in the future should be addressed by the Commission when the Commission reviews such an agreement 20 years in the future.

4. What FiT attributes should be subject to periodic reexamination?

The FIT rates and the grid penetration limits for intermittent renewable generation under Intervenors' FIT should be subject to periodic re-examination.

5. When should periodic reexaminations occur?

Periodic re-examination of the FIT rates and the grid penetration limits for intermittent renewable generation under Intervenors' FIT should occur at intervals of 2 to 3 years.

6. What data should FiT projects have to submit?

The Commission should require that the developer of a project eligible for FIT provide information about the capital and operating costs of the project, and the kilowatt-hours of renewable energy generated by the project or that would have been generated by the project but for curtailment.

7. Who should receive renewable energy credits and green attributes?

The project owner should receive the value of RECs or other green attributes from FiT projects because the project owner who took the risk in developing the renewable energy project is entitled to the rewards of the project, including the value of any

environmental credits associated with the project in any market set up for the exchange of such credits.

8. Should the tariff state the possibility that the commission can suspend the FiT based on reliability concerns?

No. Reservation of a right to suspend the FiT due to reliability concerns would eliminate the interconnection certainty (for projects meeting the utility's interconnection requirements) and the price and revenue certainty that make the FiT an effective policy for encouraging rapid development of renewable generation at minimal cost to ratepayers and maximum benefit to the general public. Reliability concerns arising from interconnection of renewable generation have nothing to do with the rate – whether an FIT rate or some other rate -- paid by the utility for such generation. Reliability concerns should be addressed through review of existing technical standards and procedures for interconnection of renewable generation, not through review of rates paid for renewable generation.

VI. Utility cost recovery: What principles should apply?

The utility should be assured of cost recovery for its FiT renewable energy purchases (including payments for renewable energy that would have been generated and delivered to the utility but for curtailment), but cost recovery by the utility should not be a condition precedent for FiT payments to renewable generators or for enforceability of FiT contracts by renewable generators.

Commission Decisions

1. Are either additions to rate base or assured recovery for the utility appropriate?

Additions to rate base of the utility's expenditures for purchases of renewable electricity under the FIT are not appropriate because such additions serve no purpose other than to augment the utility's profits at the expense of ratepayers. The utility should be assured of cost recovery for its FiT renewable energy purchases (including payments for renewable energy that would have been generated and delivered to the utility but for curtailment).

2. How should FiT costs be allocated to the customers of the three HECO companies?

FiT costs should be allocated among the HECO subsidiaries and their customers based on the FiT energy purchases made by such subsidiaries.

VII. What are the appropriate processes for accepting and interconnecting FiT projects?

An interconnection queuing process modeled after the first-ready, first-served queuing process of the Midwest ISO is an appropriate process for accepting interconnection requests for projects eligible for FIT rates. Existing technical processes, *viz.* Rule 14H, are appropriate for interconnecting projects eligible for FIT rates.

Commission Decisions

1. What queuing and interconnection procedures should FiT Projects use?

Projects eligible for FIT rates should use a queuing process for interconnection requests that is modeled after the first-ready, first-served queuing process of the Midwest ISO. Such projects should use existing interconnection procedures, *viz.*, Rule 14H.

2. What, if any, modifications should be made to Rule 14 provisions for penetration of generating sources and remote control?

Zero Emissions believes that modifications to Rule 14 provisions for increased penetration and remote control of intermittent renewable generation, such as solar and wind generation, is beyond the scope of this docket and should be addressed in a separate proceeding relating to technical requirements for interconnection of distributed and/or renewable generation.

VIII. If the Commission does approve FiTs, what actions can it take to keep total costs reasonable?

If the Commission approves a true FIT like Intervenors' FIT, it can keep total costs reasonable by adopting the island-wide grid penetration limits for intermittent renewable generation, and island-wide aggregate capacity limits for total renewable generation based on island-wide aggregate load, in Intervenors' FIT. Such limits avoid the imposition of unnecessary and, therefore, unreasonable costs on ratepayers because (1) it is not reasonable to oblige the utility and ratepayers to purchase renewable generation from intermittent sources (solar and wind) if such renewable generation displaces no fixed generation from imported fuels because of the need to maintain such fixed generation to maintain present-day levels of grid reliability, and (2) it is not reasonable to oblige the utility and ratepayers to purchase renewable generation beyond the point that renewable generation meets 100% of the load for each island.

Commission Decisions

1. **Should the commission limit the FiT scope (i.e., eligible technologies, project size) initially? If so, at what rate should the commission then expand the scope?**

No. Limitations on the scope of the initial FIT -- like the eligible technology, project size and aggregate capacity limits contained in the HECO/CA FIT – contain ratepayer costs at the rate of $.002/kWh (the difference between the $.008/kWh cost to

ratepayers of the Intervenors' FIT and the $.006/kWh cost to ratepayers of the HECO/CA FIT) by depriving the public of the energy security benefit that has a value to the public of $.40/kWh, as shown in Zero Emissions' cost-benefit analysis at Appendix 2. Such limitations have a cost-benefit ratio of 200-to-1 ($.40/kWh cost of foregone energy security benefits vs. $.002/kWh benefit of ratepayer cost savings). They make no economic sense.

2. Should the commission establish purchase caps as a means of keeping total costs reasonable? If so, what purchase caps should the FiT contain?

No. Purchase caps – like those contained in the HECO/CA FIT – when combined with the other limitations in the HECO/CA FIT, contain ratepayer costs at the rate of $.002/kWh (the difference between the $.008/kWh cost to ratepayers of the Intervenors' FIT and the $.006/kWh cost to ratepayers of the HECO/CA FIT) by depriving the public of the energy security benefit that has a value to the public of $.40/kWh, as shown in Zero Emissions' cost-benefit analysis at Appendix 2. The purchase caps contained in the HECO/CA FIT produce costs to the public (in the form of foregone energy security benefits at $.40/kWh) that are 200 times greater than the savings that they produce for ratepayers (at the rate of $.002/kWh).

The only purchase caps that the commission should establish are the island-wide grid penetration limits for intermittent renewable generation, and the island-wide aggregate capacity limits based on island-wide aggregate load, contained in Intervenors' FIT. These kinds of purchase caps keep the total cost to ratepayers reasonable because (1) it is not reasonable to oblige the utility and ratepayers to purchase renewable generation from intermittent sources (solar and wind) if such renewable generation

displaces no fixed generation from imported fuels because of the need to maintain such fixed generation to maintain present-day levels of grid reliability, and (2) it is not reasonable to oblige the utility and ratepayers to purchase renewable generation beyond the point that renewable generation meets 100% of the load for each island.

3. Should the FiT rates decline over time?

FIT rates should decline over time to reflect: (1) technological improvements that lower the levelized cost of electricity over time, and (2) declines in the cost of capital over time as investors perceive sustained diminishment of market risks and policy risks of renewable generation development in Hawaii over time.

4. Should the tariff state the possibility that the commission can suspend the FiT based on cost concerns?

No. Stating the possibility that the commission can suspend the FiT based on cost concerns would destroy the price and revenue predictability that reduces the cost of capital for development of renewable generation, and that makes the feed-in tariff a cost-efficient means of achieving rapid development of renewable generation.

* * * *

DATED: Honolulu, Hawaii, June 26, 2009

Erik Kvam
Chief Executive Officer
Zero Emissions Leasing LLC

Chris Mentzel by Erik
Chris Mentzel
Chief Executive Officer
Clean Energy Maui LLC

APPENDIX 1

PROPOSAL FOR FEED-IN TARIFF

SCHEDULE FIT

Feed-in Tariff – Purchases from Renewable Energy Facilities

Definitions:

For the purposes of this Schedule:

(1) "Biogas" means a gaseous fuel produced by anaerobic decomposition of organic matter.

(2) "Biomass" means aquatic or terrestrial plant material, vegetation, or agricultural waste, originating in the State of Hawaii, used as a fuel or energy source.

(3) "Company" means Hawaiian Electric Company, Inc.

(4) "Concentrating Solar Power Facility" means a Renewable Energy Generating Facility that generates electricity by concentrating Solar Radiation to heat a working fluid that drives a generator.

(5) "Electrical Capacity" means the installed maximum potential alternating-current electricity generating capacity, in kilowatts, of a Renewable Energy Generating Facility.

(6) "Energy Storage Facility" means any identifiable facility, plant, installation, project, equipment, apparatus, or the like, located in the State of Hawaii, placed in service after the effective date of this Schedule, and that stores Renewable Energy generated from a Renewable Energy Source, including battery systems, pumped storage, and distributed and virtual storage.

(7) "Energy Source" means a Renewable Energy Source or Stored Energy.

(8) "Hybrid Facility" means a Renewable Energy Generating Facility that generates electricity from two or more Renewable Energy Sources, or a Renewable Energy Facility comprised of a Renewable Energy Generating Facility and an Energy Storage Facility.

(9) "Hydropower" means the energy of moving water, including wave energy, ocean thermal energy conversion, and tidal energy.

(10) "Non-Wood-Burning Generating Facility" means a Renewable Energy Generating Facility that generates electricity from Biomass and that is not a Wood-Burning Generating Facility.

(11) "Offshore Wind Generating Facility" means a Wind Generating Facility that is located in an ocean water depth of at least 20 meters.

(12) "Onshore Wind Generating Facility" means any Wind Generating Facility that is not an Offshore Wind Generating Facility.

(13) "Photovoltaic Generating Facility" means a Renewable Energy Generating Facility that generates electricity from unconcentrated Solar Radiation.

(14) "Renewable Energy" means Renewable Source Energy or Stored Energy.

(15) "Renewable Energy Facility" means a Renewable Energy Generating Facility or an Energy Storage Facility.

(16) "Renewable Energy Generating Facility" means any identifiable facility, plant, installation, project, equipment, apparatus, or the like, located in the State of Hawaii, placed in service after the effective date of this Schedule, and that generates Renewable Energy from a Renewable Energy Source.

(17) "Renewable Energy Generator" means any person that owns, controls, operates, manages, or uses a Renewable Energy Generating Facility to generate Renewable Energy from a Renewable Energy Source.

(18) "Renewable Energy Provider" means a Renewable Energy Generator or a Stored Energy Provider.

(19) "Renewable Energy Source" means the following sources of energy:

(a) Biomass;
(b) Biogas;
(c) Geothermal Energy;
(d) Landfill Gas;
(e) Sewage Treatment Plant Gas;
(f) Hydropower;
(g) Solar Radiation;
(h) Wind.

(20) "Renewable Source Energy" means electricity generated by a Renewable Energy Generating Facility from a Renewable Energy Source.

(21) "Storage Capacity" means the installed maximum potential energy storage capacity, in kilowatt-hours, of an Energy Storage Facility.

(22) "Stored Energy" means energy stored in an Energy Storage Facility.

(23) "Stored Energy Provider" means any person that owns, controls, operates, manages, or uses an Energy Storage Facility to store Renewable Energy generated from a Renewable Energy Source.

(24) "Wood-Burning Generating Facility" means a Renewable Energy Generating Facility that burns wood to generate electricity.

(25) "Wind Generating Facility" means a Renewable Energy Generating Facility that generates electricity from Wind.

Interconnection

At the request of a Renewable Energy Provider that places a Renewable Energy Facility in service, the Company shall interconnect such Renewable Energy Facility to the electric system of the Company, provided that technical requirements set forth in the Company's Rules relating to interconnection of generating or storage facilities with the Company's electric system, as approved by the Public Utilities Commission, are met. Costs incurred to meet technical requirements of interconnection of a Renewable Energy Generating Facility shall be allocated in the manner set forth below under "Interconnection Costs." Each of the Company and the Renewable Energy Provider shall disclose to the other, within 6 weeks of a request by the other, any and all data, relating to the electric system of the Company or the Renewable Energy Facility of the Renewable Energy Provider, necessary to plan and execute such interconnection in conformity with such technical requirements.

A Renewable Energy Facility shall be designed to operate in parallel with the Company's electric system without adversely affecting the operations of its customers and without presenting safety hazards to personnel of the Company or its customers. The Renewable Energy Provider shall furnish, install, operate and maintain facilities such as relays, switches, synchronizing equipment, monitoring equipment and control and protective devices designated by the Company and specified in the standard Schedule FIT Agreement ("Schedule FIT Agreement") as suitable for parallel operation with the electric system of the Company. The Renewable Energy Facility and systems interconnecting the Renewable Energy Facility with the Company's electric system must be in compliance with all applicable safety and performance standards of the National Electric Code (NEC), the Institute of Electrical and Electronics Engineers (IEEE), and the Company's requirements for distributed generation or storage interconnected with the Company's electric system as provided in the Company's Rules, and subject to any other requirements, including payments, as provided in the Schedule FIT Agreement.

Requests to interconnect a Renewable Energy Facility in parallel with the Company's electric system will be processed in accordance with the procedures in Appendix II.

Interconnection Costs

	Tier 1	Tier 2	Tier 3
	Electrical Capacity (kW)		
Oahu	1 - 500 kW	501–1000 kW	> 1000 kW
Maui & Hawaii	1 - 250 kW	251–500 kW	> 500 kW
Lanai & Molokai	1 - 100 kW	101–250 kW	251 – 500 kW
	Interconnection Features and Standards		
Voltage Regulation	None	None	Yes
Frequency Regulation	None	None	Yes
SCADA	None	None	Yes
	Allocation of Interconnection Costs		
Interconnection Review Study (IRS) Costs	Company	Company	Renewable Energy Provider
System and feeder studies and technology verification studies performed by the utility	Company	Company	Company
Project risk assessment costs including costs associated with curtailment studies	Company	Company	50% Company; 50% Renewable Energy Provider
Line extension and transformation	Renewable Energy Provider	Renewable Energy Provider	Renewable Energy Provider

equipment specific to the project			
Substation specific to the project	Company	Company	Company
Equipment installed at the customer site specific to the project	Renewable Energy Provider	Renewable Energy Provider	Renewable Energy Provider
SCADA, control system, and curtailment system specific to the project	Company	Company	Renewable Energy Provider
Utility system costs and upgrades	Company	Company	Company

Schedule FIT Agreement:

The Company shall offer a Schedule FIT Agreement, in the form provided in Appendix I, to any Renewable Energy Provider that requests interconnection of a Renewable Energy Facility to the electric system of the Company under this Schedule. Each such Schedule FIT Agreement shall oblige the Company to purchase and pay for all Renewable Energy generated or stored by the Renewable Energy Facility and delivered to the electric system of the Company, and to purchase and pay for all Renewable Source Energy that would be generated by a Renewable Energy Generating Facility and delivered to the electric system of the Company but for curtailment by the Company of generation or delivery of Renewable Source Energy by the Renewable Energy Generating Facility.

Each such Schedule FIT Agreement shall oblige the Company to purchase and pay for all such Renewable Energy at the feed-in tariff rate of compensation (in cents per kilowatt-hour) set forth in this Schedule. The Company shall compensate the Renewable Energy Provider for such Renewable Energy in an amount no less than the number of kilowatt-hours of such Renewable Energy multiplied by such rate of compensation.

With respect to Renewable Energy generated by a Hybrid Facility and delivered to the electric system of the Company, each such Schedule FIT Agreement shall oblige the Company to take all such Renewable Energy, and shall oblige the Company to purchase and pay for such Renewable Energy at the feed-in tariff rate of compensation (in cents per kilowatt-hour) set forth in this Schedule for each Energy Source from which such Renewable Energy is delivered.

Procedures for requesting and executing a Schedule FIT Agreement are provided in Appendix II to this Schedule.

Metering:

The Company, at its expense, shall install a meter to record the flow of Renewable Energy delivered to the electric system of the Company. The Renewable Energy Provider shall, at its expense, provide, install and maintain all conductors, service switches, fuses, meter sockets, meter instrument transformer housing and mountings, switchboard meter test buses, meter panels and similar devices required for service connection and meter installations on the premises of the Renewable Energy Facility in accordance with the Company's Rules.

Any energy delivered to a Renewable Energy Provider by the Company will be metered separately from any Renewable Energy delivered by the Renewable Energy Provider to the Company, either by use of multiple meters or a meter capable of separately recording the net inflow and outflow of electricity.

Purchase of Renewable Energy Delivered by a Renewable Energy Provider to the Company:

The Company shall pay for each kilowatt-hour ("kWh") of Renewable Energy delivered to the Company by a Renewable Energy Provider as follows.

Renewable Energy Source: Biomass	
Wood-Burning Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 150 kW	17.18
> 150 kW and ≤ 500 kW	13.51
> 500 kW and ≤ 5000 kW	12.18
> 5000 kW	11.45

Renewable Energy Source: Biomass	
Non-Wood-Burning Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 150 kW	28.00
> 150 kW and ≤ 500 kW	24.00
> 500 kW and ≤ 5000 kW	22.00
> 5000 kW	21.00

Renewable Energy Source: Biogas	
Renewable Energy Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 150 kW	17.18
> 150 kW and ≤ 500 kW	13.51

> 500 kW and ≤ 5000 kW	12.18
> 5000 kW and ≤ 20000 kW	11.45

Renewable Energy Source: Geothermal Energy	
Renewable Energy Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10000 kW	23.49
> 10000 kW	15.41

Renewable Energy Source: Landfill Gas or Sewage Treatment Plant Gas	
Renewable Energy Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	13.21
> 500 kW and ≤ 5000 kW	9.10

Renewable Energy Source: Hydropower	
Renewable Energy Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	18.60
> 500 kW and ≤ 2000 kW	12.70
> 2000 kW and ≤ 5000 kW	11.23
> 5000 kW and ≤ 10000 kW	8.62
> 10000 kW and ≤ 20000 kW	7.93
> 20000 kW and ≤ 50000 kW	5.86
> 50000 kW	4.70

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Oahu Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	47.9
≥ 10 kW and ≤ 100 kW	43.6
≥ 100 kW and ≤ 500 kW	39.6
≥ 500 kW and ≤ 5000 kW	36.3
≥ 5000 kW	33.0

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Maui Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	52.7
≥ 10 kW and ≤ 100 kW	47.9
≥ 100 kW and ≤ 500 kW	43.6
≥ 500 kW and ≤ 5000 kW	39.9
≥ 5000 kW	36.3

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Molokai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	57.5
≥ 10 kW and ≤ 100 kW	52.3
≥ 100 kW and ≤ 500 kW	47.5
≥ 500 kW and ≤ 5000 kW	43.6

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Lanai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	57.5
≥ 10 kW and ≤ 100 kW	52.3
≥ 100 kW and ≤ 500 kW	47.5
≥ 500 kW and ≤ 5000 kW	43.6

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Hawaii Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	53.7
≥ 10 kW and ≤ 100 kW	48.8
≥ 100 kW and ≤ 500 kW	44.4
≥ 500 kW and ≤ 5000 kW	40.7
≥ 5000 kW	37.0

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Oahu Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	39.6
> 500 kW and ≤ 5000 kW	36.3
> 5000 kW and ≤ 10000 kW	33.0
> 10000 kW and ≤ 20000 kW	30.0

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Maui Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	43.6
> 500 kW and ≤ 5000 kW	39.9
> 5000 kW and ≤ 10000 kW	36.3
> 10000 kW and ≤ 20000 kW	34.3

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Molokai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	47.5
> 500 kW and ≤ 5000 kW	43.6

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Lanai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	47.5
> 500 kW and ≤ 5000 kW	43.6

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Hawaii Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	44.4
> 500 kW and ≤ 5000 kW	40.7
> 5000 kW and ≤ 10000 kW	37.0
> 10000 kW and ≤ 20000 kW	35.0

Renewable Energy Source: Wind	
Onshore Wind Generating Facility Years of Agreement Term	Feed-in Tariff Rate (¢/kWh)
Years 1 through 5	13.51
Years 6 through 20	7.37

Renewable Energy Source: Wind	
Offshore Wind Generating Facility Years of Agreement Term	Feed-in Tariff Rate (¢/kWh)
Years 1 through 12	22.02
Years 13 through 20	5.14

Energy Source: Stored Energy	
Energy Storage Facility Electrical Storage Capacity	Feed-in Tariff Rate (¢/kWh)
≤ 1000 kWh	30.00
> 1000 kWh	25.00

The Commission shall periodically adjust the Schedule FIT feed-in tariff rates of compensation in accordance with the procedures provided in Appendix III of this Schedule. The Renewable Energy Provider shall receive the feed-in tariff rate of compensation in effect at the time of execution of the Schedule FIT Agreement for the entire term of the Schedule FIT Agreement.

Term of Schedule FIT Agreement:

The term of the Schedule FIT Agreement will be as follows, commencing on the initial delivery of Renewable Energy under the Schedule FIT Agreement from the Renewable Energy Provider to the Company:

Energy Source	Term of Agreement
Biomass	20 years
Biogas	20 years
Geothermal Energy	20 years
Landfill Gas	20 years
Sewage Treatment Plant Gas	20 years
Hydropower	20 years
Solar Radiation	20 years
Wind	20 years
Stored Energy	20 years

Net Energy Metering

A Renewable Energy Provider that is eligible to enter into a net energy metering agreement with the Company shall have a choice of either (1) entering into a net energy metering agreement with the Company, or (2) entering into a Schedule FIT Agreement with the Company.

Penetration Limits for Intermittent Renewable Energy Sources

The obligations of the Company to interconnect a Renewable Energy Generating Facility to the Company's electric system and to offer an Schedule FIT Agreement to a Renewable Energy Generator to purchase and pay for Renewable Source Energy at a feed-in tariff rate of compensation under this Schedule shall not apply with respect to Renewable Source Energy produced by a Renewable Energy Generating Facility that is (i) a Wind Generating Facility, and that is placed in service after December 31 of the year following the year during which the aggregate Electrical Capacity of Renewable Energy Generating Facilities that are Wind Generating Facilities as to which technical requirements for interconnection have been met equals or exceeds 25 per cent of the peak demand for such electrical system, provided that the Public Utilities Commission may increase, by rule or order, such aggregate Electrical Capacity limit above 25 per cent of such peak demand, or (ii) a Photovoltaic Generating Facility or a Concentrating Solar Generating Facility, and that is placed in service after December 31 of the year following the year during which the aggregate Electrical Capacity of Renewable Energy Generating Facilities that are Photovoltaic Generating Facilities or Concentrating Solar Generating Facilities as to which technical requirements for interconnection have been met equals or exceeds 20 per cent of the peak demand for such electrical system, provided that the Public Utilities Commission may increase, by rule or order, such aggregate Electrical Capacity limit above the above-referenced 25 per cent and 20 per cent peak demands.

Aggregate Limits

The obligations of the Company to interconnect a Renewable Energy Generating Facility to the Company's electric system and to offer an Schedule FIT Agreement to a Renewable Energy Generator to purchase and pay for Renewable Source Energy at a feed-in tariff rate of compensation under this Schedule shall not apply with respect to Renewable Source Energy generated by a Renewable Energy Generating Facility that is placed in service after December 31 of the year following the year during which the aggregate Electrical Capacity of Renewable Energy Generating Facilities as to which technical requirements for interconnection have been met equals or exceeds 100 per cent of the peak demand for such electrical system, provided that the Public Utilities Commission may increase, by rule or order, such aggregate Electrical Capacity limit above 100 per cent of such peak demand.

Queuing Procedures:

Requests for interconnection of Renewable Energy Facilities under this Schedule shall be administered on a first-ready, first-to-interconnect basis, modeled after the queuing procedures adopted by the Midwest Independent Transmission System Operator, Inc. *See* Midwest Independent Transmission System Operator ("Midwest ISO"), Generator Interconnection Process Tariff (August 25, 2008) http://www.midwestmarket.org/publish/Document/ 25f0a7_11c1022c619_-7d600a48324a/Attachment%20X%20GIP.pdf?action=download&_property=Attachment; Midwest ISO, Business Practices Manual: Generator Interconnection (Manual No. 15, TP-BPM-004-r2, January 6, 2009) http://www.midwestmarket.org/publish/Document/45e84c_11cdc615aa1_-7e010a48324a.

Renewable Energy Certificates:

Any certificate, credit, allowance, green tag, or other transferable indicia or environmental attribute, verifying the generation of a particular quantity of energy from a Renewable Energy Source, indicating the generation of a specific quantity of Renewable Source Energy by a Renewable Energy Generating Facility, or indicating a Renewable Energy Generator's ownership of any environmental attribute associated with such generation, is the property of the Renewable Energy Generator and freely assignable by the Renewable Energy Generator.

APPENDIX 2

CLEAN ENERGY SCENARIO PLANNING

Figures for the rates at which additional amounts of renewable generation would be placed in service in Hawaii during the next 5 years under each of the No FIT Option, the HECO/CA FIT Option and the Intervenors' FIT Option were projected as follows:

	No FIT Option	HECO/CA FIT Option	Intervenors' FIT Option
Onshore Wind: Oahu	8 MW/yr[a]	8 MW/yr	30 MW/yr[b]
Onshore Wind: Maui	0 MW/yr[c]	0 MW/yr	5 MW/yr[d]
Onshore Wind: Hawaii	0 MW/yr[e]	0 MW/yr	5 MW/yr[f]
Solar PV: Oahu NEM non-NEM	1 MW/yr[g] 0 MW/yr[h]	.5 MW/yr[i] 3 MW/yr[j]	1 MW/yr[k] 45.5 MW/yr[l]
Solar PV: Maui NEM non-NEM	.5 MW/yr[m] 1.5 MW/yr[n]	.2 MW/yr[o] 2 MW/yr[p]	.5 MW/yr[q] 7.5 MW/yr[r]
Solar PV: Hawaii NEM Non-NEM	.5 MW/yr[s] 0 MW/yr	.3 MW/yr[t] 1.5 MW/yr[u]	.5 MW/yr[v] 7.5 MW/yr[w]
Concentrating Solar	.5 MW/yr[x]	.5 MW/yr	3 MW/yr[y]
Landfill Gas	0 MW/yr	0 MW/yr	1 MW/yr[z]
Biogas	0 MW/yr	0 MW/yr	4 MW/yr[aa]
Biomass	0 MW/yr[bb]	0 MW/yr	6 MW/yr[cc]
Geothermal	0 MW/yr[dd]	0 MW/yr	6 MW/yr[ee]
TOTAL	**12 MW/yr**	**16 MW/yr**	**122.5 MW/yr**

The total costs, total benefits and net benefits of each of the No FIT Option, the HECO/CA FIT Option and Intervenors' Option (the "Options") were projected as follows:

Total costs and total benefit figures for each of the Options were projected out for 5 years, based on most currently available data for Hawaii, except as noted. Costs and benefits were levelized across 5 years with no adjustments for price inflation or deflation.

Rates of additions to renewable generation in Hawaii were projected based on the "clean energy scenario planning" in Section IV.B above. The rates of addition reflect no acceleration or deceleration due to market, technological or policy factors other than the proposed Options.

Rates of renewable energy generated per MW of additional renewable generation were based on Hawaii data[ff], except for the rate relating to concentrating solar power, which was based on United States data.[gg]

Costs of renewable energy generated in $ per kilowatt-hour under the No FIT Option were projected based on Hawaii price data for negotiated PPAs[hh] and the average retail electricity price in Hawaii for NEM.[ii] Costs of renewable energy generated in $ per kilowatt-hour under the HECO/CA FIT Option were projected based on average FIT rates contained in Zero Emissions Proposal for Feed-in Tariff at Appendix 1. Costs of renewable energy generated in $ per kilowatt-hour under the Intervenors' FIT Option were projected based on average FIT rates contained in Zero Emissions Proposal for Feed-in Tariff at Appendix 1 and the average retail electricity price in Hawaii for NEM.

The benefits of fuel savings in $ per kilowatt-hour were based on the utility's avoided energy cost data for May 2009[ij,kk]. The distributed generation benefits of $.0744/kWh for solar PV and CSP is the sum of average estimated values for avoided

generation capacity capital and fixed O&M costs ($.03685/kWh), avoided transmission & distribution costs ($.0157/kWh), avoided generation and transmission & distribution losses ($.0094/kWh), grid support benefits ($.0185/kWh) and fossil fuel price hedge benefits ($.0068/kWh).[ll] The distributed generation benefits of $.015/kWh for wind, $.059/kWh for landfill gas/biogas, $.066/kWh for biomass and $.028/kWh for geothermal were obtained by multiplying the $1550/kW capital cost of new additions to diesel-fired generating capacity in Hawaii[mm] times a capital recovery factor of 12.15%[nn] times the estimated effective load carrying capability (ELCC) for each of wind, biomass (including biogas and landfill gas) and geothermal[oo] divided by the rates of renewable energy generated per kW of additional renewable generation shown in this Appendix.

The energy security benefits in $ per kilowatt-hour were obtained by measuring the mitigation value of each kilowatt-hour of additional renewable energy in terms of the Hawaii gross domestic product (GDP) that otherwise would be lost as a result of a 10% loss of oil imports for electricity generation in Hawaii during the next 5 years.[pp] The energy security benefit measures the value of mitigating the catastrophic risks and costs of Hawaii's dependence on imported oil for electricity generation.

The net benefit (cost) on the typical residential electricity bill was projected by adding the net benefits and costs of the additions to renewable generation under each of the Options during the 5 year period, dividing the total net benefit (or cost) by a projection of the HECO Companies' sales during the 5 year period[qq] to obtain total net benefit (or cost) as a percentage of the HECO Companies' projected sales, and multiplying that percentage times the dollar amount of a typical Hawaii residential monthly bill.

NO FIT OPTION

Year	Cumulative Generation at:	Annual Generation at:	Cost at Comp Bid, Negotiated or NEM Rate of:	Avoided Fuel Cost Benefits at Avoided Cost Rate of:	Distributed Generation Benefits at:	Net Benefit (Cost) in $	Energy Security Benefit at:	Net Benefit (Cost) in $ including Energy Security Benefit
Oahu Wind:	8	3,262,795	($0.084)	$0.097	$0.015		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	8	26,102,356	($2,192,598)	$2,531,929	$391,535	$730,866	$10,342,854	$11,073,720
2	16	52,204,712	($4,385,196)	$5,063,857	$783,071	$1,461,732	$20,685,707	$22,147,439
3	24	78,307,068	($6,577,794)	$7,595,786	$1,174,606	$2,192,598	$31,028,561	$33,221,159
4	32	104,409,425	($8,770,392)	$10,127,714	$1,566,141	$2,923,464	$41,371,415	$44,294,879
5	40	130,511,781	($10,962,990)	$12,659,643	$1,957,677	$3,654,330	$51,714,269	$55,368,599
PV Oahu:	1	2,340,833	($0.213)	$0.097	$0.0744		$0.40	
NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	1	2,340,833	($498,598)	$227,061	$174,158	($97,379)	$927,537	$830,158
2	2	4,681,667	($997,195)	$454,122	$348,316	($194,757)	$1,855,074	$1,660,316
3	3	7,022,500	($1,495,793)	$681,183	$522,474	($292,136)	$2,782,611	$2,490,475
4	4	9,363,333	($1,994,390)	$908,243	$696,632	($389,515)	$3,710,147	$3,320,633
5	5	11,704,167	($2,492,988)	$1,135,304	$870,790	($486,893)	$4,637,684	$4,150,791
PV Maui:	0.5	2,340,833	($0.213)	$0.092	$0.0744		$0.40	
NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	0.5	1,170,417	($249,299)	$107,678	$87,079	($54,541)	$463,768	$409,227
2	1	2,340,833	($498,598)	$215,357	$174,158	($109,083)	$927,537	$818,454
3	1.5	3,511,250	($747,896)	$323,035	$261,237	($163,624)	$1,391,305	$1,227,681
4	2	4,681,667	($997,195)	$430,713	$348,316	($218,166)	$1,855,074	$1,636,908
5	2.5	5,852,083	($1,246,494)	$538,392	$435,395	($272,707)	$2,318,842	$2,046,135
PV Maui:	1.5	2,340,833	($0.270)	$0.092	$0.0744		$0.40	
non-NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	1.5	3,511,250	($948,038)	$323,035	$261,237	($363,766)	$1,391,305	$1,027,540
2	3	7,022,500	($1,896,075)	$646,070	$522,474	($727,531)	$2,782,611	$2,055,080
3	4.5	10,533,750	($2,844,113)	$969,105	$783,711	($1,091,297)	$4,173,916	$3,082,619
4	6	14,045,000	($3,792,150)	$1,292,140	$1,044,948	($1,455,062)	$5,565,221	$4,110,159
5	7.5	17,556,250	($4,740,188)	$1,615,175	$1,306,185	($1,818,828)	$6,956,526	$5,137,699

PV Hawaii:	0.5	2,340,833	($0.213)	$0.124	$0.0744		$0.40	
NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	0.5	1,170,417	($249,299)	$145,132	$87,079	($17,088)	$463,768	$446,680
2	1	2,340,833	($498,598)	$290,263	$174,158	($34,176)	$927,537	$893,361
3	1.5	3,511,250	($747,896)	$435,395	$261,237	($51,264)	$1,391,305	$1,340,041
4	2	4,681,667	($997,195)	$580,527	$348,316	($68,352)	$1,855,074	$1,786,721
5	2.5	5,852,083	($1,246,494)	$725,658	$435,395	($85,440)	$2,318,842	$2,233,402
CSP:	0.5	1,752,000	($0.21)	$0.101	$0.0744		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	0.5	876,000	($183,960)	$88,476	$65,174	($30,310)	$347,108	$316,799
2	1	1,752,000	($367,920)	$176,952	$130,349	($60,619)	$694,216	$633,597
3	1.5	2,628,000	($551,880)	$265,428	$195,523	($90,929)	$1,041,324	$950,396
4	2	3,504,000	($735,840)	$353,904	$260,698	($121,238)	$1,388,432	$1,267,194
5	2.5	4,380,000	($919,800)	$442,380	$325,872	($151,548)	$1,735,541	$1,583,993
	MW	kWh						
Avg annual additions	12	35,171,273						
5 year total	60							

Total Net Benefit (Cost) 1st 5 Years:		$2,516,741	$211,561,852
divided by:			
2007 Annual HECO Companies Sales in $	$2,090,547,000		
times: 5 years	5		
equals: HECO Companies Sales in $ 1st 5 Years:		$10,452,735,000	$10,452,735,000
Net Benefit (Cost) as % of Utility Sales:		0.02%	2.02%
Typical Hawaii Monthly Residential Bill in kWh	600		
times: 2007 Average Hawaii Retail Price per kWh	$0.213		
equals: Typical Hawaii Monthly Residential Bill in $		$127.80	$127.80
Net Benefit (Cost) on Average Residential Monthly Bill:		$0.03	$2.59
Net Benefit (Cost) in $/kWh:		$0.000	$0.004

HECO/CA FIT OPTION

Year	Cumulative Generation at:	Annual Generation at:	Cost at NEM or FIT Rate of:	Avoided Fuel Cost Benefits at Avoided Cost Rate of:	Distributed Generation Benefits at:	Net Benefit (Cost) in $	Energy Security Benefit at:	Net Benefit (Cost) in $ including Energy Security Benefit
Oahu Wind:	8	3,262,795	($0.135)	$0.097	$0.015		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	8	26,102,356	($3,526,428)	$2,531,929	$391,535	($602,964)	$10,342,854	$9,739,889
2	16	52,204,712	($7,052,857)	$5,063,857	$783,071	($1,205,929)	$20,685,707	$19,479,779
3	24	78,307,068	($10,579,285)	$7,595,786	$1,174,606	($1,808,893)	$31,028,561	$29,219,668
4	32	104,409,425	($14,105,713)	$10,127,714	$1,566,141	($2,411,858)	$41,371,415	$38,959,557
5	40	130,511,781	($17,632,142)	$12,659,643	$1,957,677	($3,014,822)	$51,714,269	$48,699,447
PV Oahu:	0.5	2,340,833	($0.213)	$0.097	$0.0744		$0.40	
NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	0.5	1,170,417	($249,299)	$113,530	$87,079	($48,689)	$463,768	$415,079
2	1	2,340,833	($498,598)	$227,061	$174,158	($97,379)	$927,537	$830,158
3	1.5	3,511,250	($747,896)	$340,591	$261,237	($146,068)	$1,391,305	$1,245,237
4	2	4,681,667	($997,195)	$454,122	$348,316	($194,757)	$1,855,074	$1,660,316
5	2.5	5,852,083	($1,246,494)	$567,652	$435,395	($243,447)	$2,318,842	$2,075,395
PV Oahu:	3	2,340,833	($0.363)	$0.097	$0.0744		$0.40	
non-NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	3	7,022,500	($2,549,168)	$681,183	$522,474	($1,345,511)	$2,782,611	$1,437,100
2	6	14,045,000	($5,098,335)	$1,362,365	$1,044,948	($2,691,022)	$5,565,221	$2,874,199
3	9	21,067,500	($7,647,503)	$2,043,548	$1,567,422	($4,036,533)	$8,347,832	$4,311,299
4	12	28,090,000	($10,196,670)	$2,724,730	$2,089,896	($5,382,044)	$11,130,442	$5,748,398
5	15	35,112,500	($12,745,838)	$3,405,913	$2,612,370	($6,727,555)	$13,913,053	$7,185,498
PV Maui:	0.2	2,340,833	($0.213)	$0.092	$0.0744		$0.40	
NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	0.2	468,167	($99,720)	$45,412	$34,832	($19,476)	$185,507	$166,032
2	0.4	936,333	($199,439)	$90,824	$69,663	($38,951)	$371,015	$332,063
3	0.6	1,404,500	($299,159)	$136,237	$104,495	($58,427)	$556,522	$498,095
4	0.8	1,872,667	($398,878)	$181,649	$139,326	($77,903)	$742,029	$664,127
5	1	2,340,833	($498,598)	$227,061	$174,158	($97,379)	$927,537	$830,158

PV Maui:	2	2,340,833	($0.399)	$0.092	$0.0744		$0.40	
non-NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	2	4,681,667	($1,867,985)	$430,713	$348,316	($1,088,956)	$1,855,074	$766,118
2	4	9,363,333	($3,735,970)	$861,427	$696,632	($2,177,911)	$3,710,147	$1,532,236
3	6	14,045,000	($5,603,955)	$1,292,140	$1,044,948	($3,266,867)	$5,565,221	$2,298,354
4	8	18,726,667	($7,471,940)	$1,722,853	$1,393,264	($4,355,823)	$7,420,295	$3,064,472
5	10	23,408,333	($9,339,925)	$2,153,567	$1,741,580	($5,444,778)	$9,275,368	$3,830,590
PV Hawaii:	0.3	2,340,833	($0.213)	$0.124	$0.0744		$0.40	
NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	0.3	702,250	($149,579)	$68,118	$52,247	($29,214)	$278,261	$249,047
2	0.6	1,404,500	($299,159)	$136,237	$104,495	($58,427)	$556,522	$498,095
3	0.9	2,106,750	($448,738)	$204,355	$156,742	($87,641)	$834,783	$747,142
4	1.2	2,809,000	($598,317)	$272,473	$208,990	($116,854)	$1,113,044	$996,190
5	1.5	3,511,250	($747,896)	$340,591	$261,237	($146,068)	$1,391,305	$1,245,237
PV Hawaii:	1.5	2,340,833	($0.407)	$0.124	$0.0744		$0.40	
non-NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	1.5	3,511,250	($1,429,079)	$435,395	$261,237	($732,447)	$1,391,305	$658,859
2	3	7,022,500	($2,858,158)	$870,790	$522,474	($1,464,894)	$2,782,611	$1,317,717
3	4.5	10,533,750	($4,287,236)	$1,306,185	$783,711	($2,197,340)	$4,173,916	$1,976,576
4	6	14,045,000	($5,716,315)	$1,741,580	$1,044,948	($2,929,787)	$5,565,221	$2,635,434
5	7.5	17,556,250	($7,145,394)	$2,176,975	$1,306,185	($3,662,234)	$6,956,526	$3,294,293
CSP:	0.5	1,752,000	($0.401)	$0.101	$0.0744		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	0.5	876,000	($351,276)	$88,476	$65,174	($197,626)	$347,108	$149,483
2	1	1,752,000	($702,552)	$176,952	$130,349	($395,251)	$694,216	$298,965
3	1.5	2,628,000	($1,053,828)	$265,428	$195,523	($592,877)	$1,041,324	$448,448
4	2	3,504,000	($1,405,104)	$353,904	$260,698	($790,502)	$1,388,432	$597,930
5	2.5	4,380,000	($1,756,380)	$442,380	$325,872	($988,128)	$1,735,541	$747,413
	MW	kWh						
Avg annual additions	16	43,364,189						
5 year total	80							

Net Benefit (Cost) 1st 5 Years:		($60,973,232)	$203,724,090
Plus: Added Cost of Capital Due to HECO/CA Caps:		($220,659,069)	($220,659,069)
Total Benefit (Cost) of HECO/CA FIT 1st 5 years:		($281,632,300)	($16,934,979)
divided by:			
2007 Annual HECO Companies Sales in $	$2,090,547,000		
times: 5 years	5		
equals: HECO Companies Sales in $ 1st 5 Years:		$10,452,735,000	$10,452,735,000
Net Benefit (Cost) as % of Utility Sales:		-2.69%	-0.16%
Typical Hawaii Monthly Residential Bill in kWh	600		
times: 2007 Average Hawaii Retail Price per kWh	$0.213		
equals: Typical Hawaii Monthly Residential Bill in $		$127.80	$127.80
Net Benefit (Cost) on Average Residential Monthly Bill:		($3.44)	($0.21)
Net Benefit (Cost) in $/kWh:		($0.006)	($0.000)

INTERVENORS' FIT OPTION

Year	Cumulative Generation at:	Annual Generation at:	Cost at FIT or NEM Rate of:	Avoided Fuel Cost Benefits at Avoided Cost Rate of:	Distributed Generation Benefits at:	Net Benefit (Cost) in $	Energy Security Benefit at:	Net Benefit (Cost) in $ including Energy Security Benefit
Oahu Wind:	30	3,262,795	($0.135)	$0.097	$0.015		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	30	97,883,836	($13,224,106)	$9,494,732	$1,468,258	($2,261,117)	$38,785,702	$36,524,585
2	60	195,767,671	($26,448,212)	$18,989,464	$2,936,515	($4,522,233)	$77,571,403	$73,049,170
3	90	293,651,507	($39,672,319)	$28,484,196	$4,404,773	($6,783,350)	$116,357,105	$109,573,755
4	120	391,535,342	($52,896,425)	$37,978,928	$5,873,030	($9,044,466)	$155,142,806	$146,098,340
5	150	489,419,178	($66,120,531)	$47,473,660	$7,341,288	($11,305,583)	$193,928,508	$182,622,925
Maui Wind:	5	3,262,795	($0.135)	$0.097	$0.015		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	5	16,313,973	($2,204,018)	$1,582,455	$244,710	($376,853)	$6,464,284	$6,087,431
2	10	32,627,945	($4,408,035)	$3,164,911	$489,419	($753,706)	$12,928,567	$12,174,862
3	15	48,941,918	($6,612,053)	$4,747,366	$734,129	($1,130,558)	$19,392,851	$18,262,292
4	20	65,255,890	($8,816,071)	$6,329,821	$978,838	($1,507,411)	$25,857,134	$24,349,723
5	25	81,569,863	($11,020,088)	$7,912,277	$1,223,548	($1,884,264)	$32,321,418	$30,437,154
Hawaii Wind:	5	3,262,795	($0.135)	$0.097	$0.015		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	5	16,313,973	($2,204,018)	$1,582,455	$244,710	($376,853)	$6,464,284	$6,087,431
2	10	32,627,945	($4,408,035)	$3,164,911	$489,419	($753,706)	$12,928,567	$12,174,862
3	15	48,941,918	($6,612,053)	$4,747,366	$734,129	($1,130,558)	$19,392,851	$18,262,292
4	20	65,255,890	($8,816,071)	$6,329,821	$978,838	($1,507,411)	$25,857,134	$24,349,723
5	25	81,569,863	($11,020,088)	$7,912,277	$1,223,548	($1,884,264)	$32,321,418	$30,437,154
PV Oahu:	1	2,340,833	($0.213)	$0.097	$0.0744		$0.40	
NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	1	2,340,833	($498,598)	$227,061	$174,158	($97,379)	$927,537	$830,158
2	2	4,681,667	($997,195)	$454,122	$348,316	($194,757)	$1,855,074	$1,660,316
3	3	7,022,500	($1,495,793)	$681,183	$522,474	($292,136)	$2,782,611	$2,490,475
4	4	9,363,333	($1,994,390)	$908,243	$696,632	($389,515)	$3,710,147	$3,320,633
5	5	11,704,167	($2,492,988)	$1,135,304	$870,790	($486,893)	$4,637,684	$4,150,791

PV Oahu:	45.5	2,340,833	($0.330)	$0.097	$0.0744		$0.40	
non-NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	45.5	106,507,917	($35,147,613)	$10,331,268	$7,924,189	($16,892,156)	$42,202,926	$25,310,770
2	91	213,015,833	($70,295,225)	$20,662,536	$15,848,378	($33,784,311)	$84,405,852	$50,621,541
3	136.5	319,523,750	($105,442,838)	$30,993,804	$23,772,567	($50,676,467)	$126,608,778	$75,932,311
4	182	426,031,667	($140,590,450)	$41,325,072	$31,696,756	($67,568,622)	$168,811,704	$101,243,082
5	227.5	532,539,583	($175,738,063)	$51,656,340	$39,620,945	($84,460,778)	$211,014,630	$126,553,852
PV Maui:	0.5	2,340,833	($0.213)	$0.092	$0.0744		$0.40	
NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	0.5	1,170,417	($249,299)	$107,678	$87,079	($54,541)	$463,768	$409,227
2	1	2,340,833	($498,598)	$215,357	$174,158	($109,083)	$927,537	$818,454
3	1.5	3,511,250	($747,896)	$323,035	$261,237	($163,624)	$1,391,305	$1,227,681
4	2	4,681,667	($997,195)	$430,713	$348,316	($218,166)	$1,855,074	$1,636,908
5	2.5	5,852,083	($1,246,494)	$538,392	$435,395	($272,707)	$2,318,842	$2,046,135
PV Maui:	7.5	2,340,833	($0.363)	$0.092	$0.0744		$0.40	
non-NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	7.5	17,556,250	($6,372,919)	$1,615,175	$1,306,185	($3,451,559)	$6,956,526	$3,504,968
2	15	35,112,500	($12,745,838)	$3,230,350	$2,612,370	($6,903,118)	$13,913,053	$7,009,935
3	22.5	52,668,750	($19,118,756)	$4,845,525	$3,918,555	($10,354,676)	$20,869,579	$10,514,903
4	30	70,225,000	($25,491,675)	$6,460,700	$5,224,740	($13,806,235)	$27,826,105	$14,019,870
5	37.5	87,781,250	($31,864,594)	$8,075,875	$6,530,925	($17,257,794)	$34,782,631	$17,524,838
PV Hawaii:	0.5	2,340,833	($0.213)	$0.124	$0.0744		$0.40	
NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	0.5	1,170,417	($249,299)	$145,132	$87,079	($17,088)	$463,768	$446,680
2	1	2,340,833	($498,598)	$290,263	$174,158	($34,176)	$927,537	$893,361
3	1.5	3,511,250	($747,896)	$435,395	$261,237	($51,264)	$1,391,305	$1,340,041
4	2	4,681,667	($997,195)	$580,527	$348,316	($68,352)	$1,855,074	$1,786,721
5	2.5	5,852,083	($1,246,494)	$725,658	$435,395	($85,440)	$2,318,842	$2,233,402

PV Hawaii:	7.5	2,340,833	($0.370)	$0.124	$0.0744		$0.40	
non-NEM	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	7.5	17,556,250	($6,495,813)	$2,176,975	$1,306,185	($3,012,653)	$6,956,526	$3,943,874
2	15	35,112,500	($12,991,625)	$4,353,950	$2,612,370	($6,025,305)	$13,913,053	$7,887,748
3	22.5	52,668,750	($19,487,438)	$6,530,925	$3,918,555	($9,037,958)	$20,869,579	$11,831,621
4	30	70,225,000	($25,983,250)	$8,707,900	$5,224,740	($12,050,610)	$27,826,105	$15,775,495
5	37.5	87,781,250	($32,479,063)	$10,884,875	$6,530,925	($15,063,263)	$34,782,631	$19,719,369
CSP:	3	1,752,000	($0.401)	$0.101	$0.0744		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	3	5,256,000	($2,107,656)	$530,856	$391,046	($1,185,754)	$2,082,649	$896,895
2	6	10,512,000	($4,215,312)	$1,061,712	$782,093	($2,371,507)	$4,165,297	$1,793,790
3	9	15,768,000	($6,322,968)	$1,592,568	$1,173,139	($3,557,261)	$6,247,946	$2,690,685
4	12	21,024,000	($8,430,624)	$2,123,424	$1,564,186	($4,743,014)	$8,330,595	$3,587,581
5	15	26,280,000	($10,538,280)	$2,654,280	$1,955,232	($5,928,768)	$10,413,244	$4,484,476
Landfill Gas:	1	3,150,000	($0.091)	$0.101	$0.059		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	1	3,150,000	($286,650)	$318,150	$185,850	$217,350	$1,248,163	$1,465,513
2	2	6,300,000	($573,300)	$636,300	$371,700	$434,700	$2,496,326	$2,931,026
3	3	9,450,000	($859,950)	$954,450	$557,550	$652,050	$3,744,488	$4,396,538
4	4	12,600,000	($1,146,600)	$1,272,600	$743,400	$869,400	$4,992,651	$5,862,051
5	5	15,750,000	($1,433,250)	$1,590,750	$929,250	$1,086,750	$6,240,814	$7,327,564
Biogas:	4	3,150,000	($0.122)	$0.101	$0.059		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	4	12,600,000	($1,534,680)	$1,272,600	$743,400	$481,320	$4,992,651	$5,473,971
2	8	25,200,000	($3,069,360)	$2,545,200	$1,486,800	$962,640	$9,985,302	$10,947,942
3	12	37,800,000	($4,604,040)	$3,817,800	$2,230,200	$1,443,960	$14,977,953	$16,421,913
4	16	50,400,000	($6,138,720)	$5,090,400	$2,973,600	$1,925,280	$19,970,604	$21,895,884
5	20	63,000,000	($7,673,400)	$6,363,000	$3,717,000	$2,406,600	$24,963,255	$27,369,855

Biomass:	6	2,795,918	($0.162)	$0.101	$0.066		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	6	16,775,510	($2,717,633)	$1,694,327	$1,107,184	$83,878	$6,647,164	$6,731,042
2	12	33,551,020	($5,435,265)	$3,388,653	$2,214,367	$167,755	$13,294,328	$13,462,084
3	18	50,326,531	($8,152,898)	$5,082,980	$3,321,551	$251,633	$19,941,493	$20,193,125
4	24	67,102,041	($10,870,531)	$6,777,306	$4,428,735	$335,510	$26,588,657	$26,924,167
5	30	83,877,551	($13,588,163)	$8,471,633	$5,535,918	$419,388	$33,235,821	$33,655,209
Geothermal:	6	7,415,677	($0.235)	$0.101	$0.028		$0.40	
	MW/yr	kWh/MW	per kWh	per kWh	per kWh		per kWh	
1	6	44,494,065	($10,451,656)	$4,493,901	$1,245,834	($4,711,921)	$17,630,424	$12,918,502
2	12	88,988,129	($20,903,312)	$8,987,801	$2,491,668	($9,423,843)	$35,260,848	$25,837,005
3	18	133,482,194	($31,354,967)	$13,481,702	$3,737,501	($14,135,764)	$52,891,271	$38,755,507
4	24	177,976,258	($41,806,623)	$17,975,602	$4,983,335	($18,847,686)	$70,521,695	$51,674,010
5	30	222,470,323	($52,258,279)	$22,469,503	$6,229,169	($23,559,607)	$88,152,119	$64,592,512
	MW	kWh						
Avg annual additions	122.5	359,089,439						
5 year total	612.5	1,795,447,194	($1,256,159,321)					

Total Net Benefit (Cost) 1st 5 Years:		($415,889,261)	$1,260,630,283
divided by:			
2007 Annual HECO Companies Sales in $	$2,090,547,000		
times: 5 years	5		
equals: HECO Companies Sales in $ 1st 5 Years:		$10,452,735,000	$10,452,735,000
Net Benefit (Cost) as % of Utility Sales:		-3.98%	12.06%
Typical Hawaii Monthly Residential Bill in kWh	600		
times: 2007 Average Hawaii Retail Price per kWh	$0.213		
equals: Typical Hawaii Monthly Residential Bill in $		$127.80	$127.80
Net Benefit (Cost) on Average Residential Monthly Bill:		($5.08)	$15.41
Net Benefit (Cost) in $/kWh:		($0.008)	$0.026

HAWAII POWER FACTORS

	kWh/year	MW	kWh/year/MW
Wind	238,184,000	73.0	3,262,795
PV Solar	2,809,000	1.2	2,340,833
Concentrating Solar (US avg)	87,600,000	50.0	1,752,000
Landfill Gas/Biogas	189,000,000	60.0	3,150,000
Biomass	137,000,000	49.0	2,795,918
Geothermal	229,886,000	31.0	7,415,677

ENERGY SECURITY BENEFIT

Hawaii Gross Domestic Product (2007)		$61,500,000,000
Cost to Hawaii of 10% decrease in world oil production as percentage of Hawaii Gross Domestic Product		2.5%
Cost to Hawaii of 10% decrease in world oil production		$1,537,500,000
Hawaii oil consumption for electricity production (10.4 million bbl/year) as a percentage of total Hawaii oil consumption (52.9 million bbl/year)		19.7%
Cost to Hawaii of 10% decrease in world oil production allocable to decreased electricity production		$302,887,500
Hawaii annual oil-fired electricity production in kWh (January 2009)	7,644,000,000	
10% decrease in Hawaii oil imports from 10% decrease in world oil production	10%	
Loss of Hawaii electricity production in kWh from 10% decrease in Hawaii oil imports	764,400,000	
Energy security benefit in $/kWh: Cost to Hawaii of 10% decrease in world oil production allocable to decreased electricity production divided by loss of Hawaii electricity production in kWh from 10% decrease in Hawaii oil imports		$0.40

ADDED COST OF CAPITAL DUE TO HECO/CA FIT CAPS

	Cumulative Generation in MW under Intervenors' FiT	Cumulative Generation in MW under HECO/CA FiT	Deferred Generation in MW Due to Caps under HECO/CA FIT	Deferred Generation in MW as Percentage of Cumulative Generation in MW under Intervenor's FIT	Cumulative Generation in kWh under Intervenor's FIT	Deferred Generation in kWh under HECO/CA FIT	FIT Rate Premium to Compensate Investors for Added Regulatory Risk Due to Caps: 20%	Added Cost of Capital Due to Caps under HECO/CA FIT
Oahu Wind	150	40	110	73.3%	1,468,257,534	1,076,722,192	($0.0270)	($29,093,034)
Maui Wind	25	0	25	100.0%	244,709,589	244,709,589	($0.0270)	($6,612,053)
Hawaii Wind	25	0	25	100.0%	244,709,589	244,709,589	($0.0270)	($6,612,053)
Oahu PV non-NEM	227.5	15	212.5	93.4%	1,597,618,750	1,492,281,250	($0.0660)	($98,490,563)
Maui PV non-NEM	37.5	10	27.5	73.3%	263,343,750	193,118,750	($0.0726)	($14,020,421)
Hawaii PV non-NEM	37.5	7.5	30	80.0%	263,343,750	210,675,000	($0.0740)	($15,589,950)
CSP	15	2.5	12.5	83.3%	78,840,000	65,700,000	($0.0802)	($5,269,140)
Landfill Gas	5	0	5	100.0%	47,250,000	47,250,000	($0.0182)	($859,950)
Biogas	20	0	20	100.0%	189,000,000	189,000,000	($0.0244)	($4,604,040)
Biomass	30	0	30	100.0%	251,632,653	251,632,653	($0.0324)	($8,152,898)
Geothermal	30	0	30	100.0%	667,410,968	667,410,968	($0.0470)	($31,354,967)
							TOTAL:	($220,659,069)

[a] Projected addition of 30 MW Kahuku Wind project plus 50 MW wind per HECO RFP (50% actually placed in service times 100 MW RFP) divided by 10 year gestation period = 8 MW/year.
[b] Projected additions equal to *ca.* 1200 MW Oahu peak load (*see* US Energy Information Administration Form EIA-861 ("EIA-861")) times Intervenors' FIT 25% grid penetration limit for wind divided by 10 year gestation period = 30 MW/year.
[c] No projected additions from proposed Molokai/Lanai, Shell Wind and Kaheawa Wind Power II projects.
[d] Projected additions equal to *ca.* 200 MW Maui peak load (per EIA-861) times Intervenors' FIT 25% grid penetration limit for wind divided by 10 year gestation period = 5 MW/year.
[e] No projected additions from proposed Na Makani Wind project.
[f] Projected additions equal to *ca.* 200 MW Hawaii peak load (per EIA-861) times Intervenors' FIT 25% grid penetration limit for wind divided by 10 year gestation period = 5 MW/year.
[g] Projected additions equal to 50% excess energy delivered to HECO from *ca.* 2.4 MW of NEM PV systems placed in service on Oahu during 2008 per HECO Companies' Net Energy Metering Status Report filed January 9, 2009) (the "NEM Report") = *ca.* 1 MW/year.
[h] No projected additions from proposed PV system to be placed in service on Ward Avenue.
[i] Projected additions equal to 50% excess energy delivered to HECO from *ca.* 2.4 MW/year of NEM PV systems on Oahu for 2 years per Final Statement of Position of the HECO Companies and Consumer Advocate (filed March 30, 2009), same as No FIT Option, followed by no projected additions to NEM PV systems on Oahu for 3 years due to HECO/CA FIT's proposed elimination of NEM = *ca.* .5 MW/year average of NEM PV systems on Oahu during next 5 years.
[j] Projected additions equal to *ca.* 45% of aggregate 6.5 MW/yr of FIT PV systems to be placed in service annually under HECO/CA FIT = *ca.* 3 MW/year; no projected additions from proposed PV Host Pilot Program.
[k] Projected additions equal to 50% excess energy delivered to HECO from *ca.* 2.4 MW of NEM PV systems placed in service on Oahu during 2008 per the NEM Report = *ca.* 1 MW/year.
[l] Projected additions equal to *ca.* 1200 MW Oahu peak load (per EIA-861) times Intervenors' FIT 20% grid penetration limit for solar times 95% of solar FIT grid penetration limit allocable to PV solar (reflecting ratio of *ca.* 10 MW PV solar to .5 MW CSP projected to be placed in service during 2009) divided by 5 year gestation period = *ca.* 45.5 MW/year; no projected additions from proposed PV Host Pilot Program.
[m] Projected additions equal to 50% excess energy delivered to MECO from *ca.* .8 MW of NEM PV systems placed in service on Maui during 2008 per the NEM Report = *ca.* .5 MW/year.
[n] Projected additions equal to 1.5 MW PV system placed in service on Lanai during 2008.
[o] Projected additions of 50% excess energy delivered to MECO from *ca.* .8 MW/year of NEM PV systems on Maui for 2 years per Final Statement of Position of the HECO Companies and Consumer Advocate (filed March 30, 2009), same as No FIT Option, followed by no projected additions to NEM PV systems on Maui for 3 years due to HECO/CA FIT's proposed elimination of NEM = *ca.* .2 MW/year average of NEM PV systems on Maui during next 5 years.
[p] Projected additions equal to *ca.* 30% of aggregate 6.5 MW/yr of FIT PV systems to be placed in service annually under HECO/CA FIT = *ca.* 2 MW/year; no projected additions from proposed PV Host Pilot Program.
[q] Projected additions equal to 50% excess energy delivered to MECO from *ca.* .8 MW of NEM PV systems placed in service on Maui during 2008 per the NEM Report = *ca.* .5 MW/year.
[r] Projected additions equal to *ca.* 200 MW Maui peak load (per EIA-861) times Intervenors' FIT 20% grid penetration limit for solar times 95% of solar FIT grid penetration limit allocable to PV solar divided by 5 year gestation period = *ca.* 7.5 MW/year; no projected additions from proposed PV Host Pilot Program.
[s] Projected additions equal to 50% excess energy delivered to HELCO from *ca.* 1.0 MW of NEM PV systems placed in service on Hawaii during 2008 per the NEM Report = *ca.* .5 MW/year.
[t] Projected additions equal to 50% excess energy delivered to HELCO from *ca.* 1.0 MW/year of NEM PV systems on Hawaii for 2 years per Final Statement of Position of the HECO Companies and Consumer Advocate (filed March 30, 2009), same as No FIT Option, followed by no projected additions to NEM PV systems on Hawaii for 3 years due to HECO/CA FIT's proposed elimination of NEM = *ca.* .3 MW/year average of NEM PV systems on Hawaii during next 5 years.

[u] Projected additions equal to *ca.* 25% of aggregate 6.5 MW/yr of FIT PV systems to be placed in service annually under HECO/CA FIT = *ca.* 1.5 MW/year; no projected additions from proposed PV Host Pilot Program.

[v] Projected additions equal to 50% excess energy delivered to HELCO from *ca.* 1.0 MW of NEM PV systems placed in service on Hawaii during 2008 per the NEM Report = *ca.* .5 MW/year.

[w] Projected additions equal to *ca.* 200 MW Hawaii peak load (per EIA-861) times Intervenors' FIT 20% grid penetration limit for solar times 95% of solar FIT grid penetration limit allocable to PV solar divided by 5 year gestation period = *ca.* 7.5 MW/year; no projected additions from proposed PV Host Pilot Program.

[x] Projected addition of one 500 kW CSP system per year like Keahole Solar Power's CSP system to be placed in service at NELHA during 2009.

[y] Projected additions equal to aggregate *ca.* 1600 MW peak load times Intervenors' FIT 20% grid penetration limit for solar times 5% of solar FIT grid penetration limit allocable to CSP divided by 5 year gestation period = *ca.* 3 MW/year.

[z] Projected addition of 5 MW Waimanolo Gulch landfill gas project divided by gestation period of 5 years = 1 MW/year.

[aa] Projected addition of 20 MW anaerobic digester system at Maui sugar mill divided by gestation period of 5 years = 4 MW/year.

[bb] No projected additions from proposed Pulehu and Hamakua biomass projects.

[cc] Projected additions of 6 MW Pulehu Power and 25 MW Hamakua biomass projects divided by gestation period of 5 years = *ca.* 6 MW/year.

[dd] No projected additions from Puna Geothermal.

[ee] Projected addition of 30 MW to Puna Geothermal generating capacity divided by 5 year gestation period = 6 MW/year.

[ff] US Energy Information Administration Form EIA-906 "Power Plant Report: Net Generation by State, Type of Producer and Energy Source" (2007); US Energy Information Administration Form EIA-860 "Annual Electric Generator Report" (2007); US Energy Information Administration "Hawaii Renewable Electricity Profile" (2006); Application filed August 22, 2008 in Docket No. 2008-0167 (PPA with Lanai Sustainability Research, LLC) (1.2 MW PV solar plant in Hawaii producing 2,809,000 kWh/year).

[gg] *Wikipedia* "Solar thermal energy," accessed at http://en.wikipedia.org/wiki/Solar_thermal_energy on May 20, 2009 (50 MW solar thermal power plant typically produces 87,600 MWh/year).

[hh] Decision and Order filed March 18, 2005 in Docket No. 04-0365 (fixed rate portion of PPC with Kaheawa Wind Power, LLC); Decision and Order filed October 31, 2008 in Docket No. 2008-0167 (PPA with Lanai Sustainability research, LLC); Decision and Order filed November 28, 2008 in Docket No. 2008-0186 (PPA with Keahole Solar Power LLC).

[ii] US Form EIA-861 "Annual Electric Power Industry Report" (2007).

[jj] May 2009 Avoided Energy Cost Data filed by the HECO Companies on April 30, 2009.

[kk] The use of avoided cost understates the fuel savings benefits of the FIT because such use assumes that the utility, which is obliged to purchase renewable energy under the FiT, will curtail first its own imported fuel generation that has a fuel cost equal to the avoided cost, which is an average of all the utility's fuel costs. In fact, the utility will first curtail its own imported fuel generation that has the *highest* fuel cost, i.e., diesel fuel peaking generation. The utility's substitution of its highest cost imported-fuel generation with renewable generation (that the utility must purchase under the FIT) is called "merit order", and the fuel cost savings from such substitution is called "merit order savings." In Germany, the federal government estimates that the merit order savings *by themselves* exceed the additional costs to German ratepayers of the utility's renewable energy purchases under the German FIT. Federal Republic of Germany Ministry for the Environment, Nature Conservation and Nuclear Safety, *EEG – The Renewable Energy Sources Act* (July 2007), accessed on May 30, 2009 at http://www.gtai.com/uploads/media/EEG_Brochure_01.pdf .

[ll] Americans for Solar Power (ASPv), *Build-up of PV Value in California* (April 13, 2005) (methodology accessed on May 30, 2009 at http://www.suncentricinc.com/downloads/aspv2005.pdf). *See* G. Harris, *Net Metering or Feed-in Tariff? Can they co-exist?* (September 2008), showing ASPv study results at http://www.suncentricinc.com/downloads/SunCentric_Business-Perspectives_Net_Metering_or_FiT.pdf The average estimated values from the ASPv study fall within the mid-range of values from similar studies reviewed for the National Renewable Energy Laboratory (NREL). J.L. Contreras, L. Frantzis, S.

Blazewicz, D. Pinault and H. Sawyer, *Photovoltaic Value Analysis*, NREL Subcontract Report NREL/SR-581-42303 (February 2008), accessed May 30, 2009 at http://www1.eere.energy.gov/solar/pdfs/42303.pdf .

[mm] The $1550/kW capital cost of new additions to diesel-fired generating capacity in Hawaii was obtained by taking the current total cost estimate of $193 million for the Campbell Industrial Park Generating Station and Transmission Additions (*see* "Update to Cost Estimate" filed by HECO on May 6, 2009 in Docket No. 05-0145), allocating about 86% of that total cost estimate to the Generation Station Additions (based on the initial cost estimate of $115,399,255 for the Generation Station Additions as a percentage of the initial cost estimate of $134,310,260 for both the Generation Station Additions and the Transmission Additions contained in the Application filed by HECO on June 17, 2005 in Docket No. 05-0145) and dividing by the estimated 107,000 kW generating capacity of the Station.

[nn] Capital recovery factor of 12.15% over 20 year period based on return on average common equity of 10.5% agreed to by parties in HECO's 2009 test year rate case proceeding. *See* Form 8-K for Hawaiian Electric Industries Inc. Item 1.01 Entry into a Material Definitive Agreement dated May 21, 2009, accessed on June 11, 2009 at http://biz.yahoo.com/e/090521/he8-k.html .

[oo] *See* M. Milligan, B. Kirby, K. Jackson and H. Shiu, "California Renewables Portfolio Standard Renewable Generation Integration Cost Study: Multi-Year Analysis (April 3, 2006), accessed on May 30, 2009 at http://www.energy.ca.gov/portfolio/documents/2006-04-03_workshop/2006-04-03_RPS_INTEGRATION_COST.PDF (average ELCC for wind = 25%; ELCC for biomass = 98%; ELCC for geothermal w/o steam constraint = 109%).

[pp] US Energy Administration "State Energy Profile: Hawaii" accessed May 21, 2009 at http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=HI# ; Testimony of Ted Liu, Director of Department of Business Economic Development and Tourism, before the House Committee on Energy and Environmental Protection re HB2308 (February 7, 2006).

[qq] US Energy Administration Form EIA-861 "Annual Electric Power Industry Report" (2007).

CERTIFICATE OF SERVICE

I hereby certify that I have this date filed and served the original and eight copies of the foregoing **JOINT REPLY BRIEF AND PROPOSAL FOR FEED-IN TARIFF OF ZERO EMISSIONS LEASING LLC AND CLEAN ENERGY MAUI LLC** in Docket No. 2008-0273, by hand delivery to the Commission at the following address:

CARLITO CALIBOSO
PUBLIC UTILITIES COMMISSION
465 S. King Street, Suite 103
Honolulu, HI 96813

I hereby further certify that I have this date served copies of the foregoing **JOINT REPLY BRIEF AND PROPOSAL FOR FEED-IN TARIFF OF ZERO EMISSIONS LEASING LLC AND CLEAN ENERGY MAUI LLC** in Docket No. 2008-0273, upon the following parties and participants by causing such copies thereof to be hand delivered, mailed by first class mail, or electronically transmitted to each such party or participant as follows:

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